

REMARKS/ARGUMENTS

The applicant's attorneys appreciate the Examiner's thorough search and remarks.

Claims 1-12 have been rejected under 35 U.S.C. §103(a) as obvious over Hurkx et al. (Hurkx), U.S. Patent No. 6,541,817, in view of Ahlers et al. (Ahlers), U.S. Patent No. 6,667,514. Reconsideration is requested.

Claims 1 and 8 have been amended and now call for devices in which columns of the first conductivity are formed directly under the bottom surface of each trench, and charge-balanced regions of the second conductivity are formed adjacent and lateral to the columns. On the other hand, the devices shown by Hurkx do not include columns of the first conductivity type directly below the bottom surface of the trenches. Indeed, regions 61 extend along the sidewalls of trenches 20. Moreover, the trenches 20 terminate in a region of only a single conductivity. Thus, it cannot be said that the conductive region 14 below trenches 20 in Hurkx correspond to the columns in claims 1 and 8. Claims 1 and 8 are, therefore, distinguishable over the combination of Hurkx and Ahlers. Reconsideration is requested.

Regarding claim 13, claim 13 is a process for manufacturing a semiconductor device. Claim 13 has been rejected as obvious over Hurkx, Luo, U.S. Patent No. 6,495,421 and Ahlers. The following has been asserted as grounds for the rejection of claim 13.

Regarding Claims 13-17, Hurkx et al. disclose a trench-gate semiconductor devices and their manufacture where in Fig. 1 it is disclose a semiconductor region of 14 formed over substrate, a semiconductor trench receiving region 10 formed over the semiconductor region 14, plurality of trenches 20 formed in the trench receiving region, each trench including a bottom surface and sidewalls 20b, conductive material 61 and 62 formed inside the trenches. Hurkx et al. fail to disclose the required method and required charge balancing structure. However, Luo discloses manufacture of semiconductor material and devices using that material where the required method is disclosed. Furthermore, Ahlers et al. disclose a semiconductor component with charge compensation structure and associated fabrication where in Fig. 8A, regions SP are charge balancing regions.

First, contrary to the position taken in the Office Action, Hurkx does not teach a device according to claim 13. Specifically, it should be noted that claim 13 calls for forming columns below the trenches. In addition, it is respectfully submitted that the rejection of claim 13 as set

forth in the Office Action is not in compliance with the MPEP. MPEP §706.02(j) ("It is important for an Examiner to properly communicate the basis for a rejection so that the issues can be identified early and the applicant can be given fair opportunity to reply.") Specifically, the rejection as set forth in the Office Action lacks any detail so as to enable the applicant to formulate a response. Indeed, the only statement resembling an analysis of the references is "Lou discloses manufacture of semiconductor material and devices using that material where the required method is disclosed." Claim 13 specifies steps in manufacturing a device. Where are these steps shown? It is respectfully submitted that the analysis set forth in the Office Action does not meet the minimum standard for setting forth a case of prima facie obviousness. See MPEP §706.02(j) (setting forth the details required for a prima facie case of obviousness). A more detailed analysis of the prior art is requested. Otherwise, the rejection should be withdrawn and claim 13 should be allowed.

Each of the remaining claims depends from one of claims 1, 8 and 13, and thus should also be deemed allowable.

The application is believed to be in condition for allowance. Such action is earnestly solicited.

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December 10, 2004

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Respectfully submitted,



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